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EXAMINER	
VAN DOREN, BETH	
ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/004,725	VENKATASUBRAMANYAN ET AL.	
	Examiner	Art Unit	
	Beth Van Doren	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. The following is a non-final, first office action on the merits. Claims 1-43 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy et al. (U.S. 6,047,290) in view of Hillier et al. (*Introduction to Operations Research*).

As per claim 1, Kennedy et al. discloses a method for generating a supply chain plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint (See figure 1, column 1, lines 39-50, column 2, lines 24-35, 39-52, and 57-64, column 3, lines 20-45, column 6, lines 15-25, wherein data is accessed associated with a supply chain. Buffers are used to store items (i.e. resources, etc.) and associated time values (i.e. delivery time, timing), wherein the supply chain network is restricted by the amount of supply of items available);

using an algorithm for the supply chain network (See column 1, lines 39-65, column 2, lines 25-32 and 55-65, and column 3, lines 25-40, wherein planning algorithms are used on the supply chain network);

calculating an optimized supply chain plan, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable (See figure 2, column 2, lines 39-65, and column 3, lines 7-32 and 40-65, column 5, lines 40-60, column 6, lines 1-15, and column 7, lines 30-50, wherein an optimized supply chain is produced by the planning system, where a quantity of items is described for each buffer based on time values); and

adjusting the optimized supply chain plan to satisfy the constraint (See column 3, lines 15-45, column 5, lines 35-60, column 7, lines 30-50, and column 8, lines 5-20, wherein the supply chain is adjusted to satisfy the limited resources/production capabilities).

However, Kennedy et al. does not expressly disclose that the algorithm used for the supply chain network is a generated linear programming problem, approximating this linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint, or calculating an optimized supply chain plan for the approximated linear programming problem.

Hillier et al. using a linear programming program, approximating this problem using discretized variables to yield a plurality of discretized variables and by relaxing the constraint to yield a relaxed constraint (See page 511, section 1, page 512, section 1, page 513, sections 1-2, page 517, section 1, wherein finite variables are used in an

programming problem. In order to increase the ease of solving the problem, a linear programming (LP) relaxation problem is used, wherein a constraint of the problem is relaxed). Hillier et al. further discloses calculating an optimized solution supply plan for the approximated linear programming problem (See page 513, section 1-2, page 514, page 517, page 519, section 1, wherein the optimal solution is derived. See page 25, section 1, page 26, section 1, page 67, section 1, wherein a supply plan is considered).

Both Hillier et al. and Kennedy et al. are concerned with supplying limited resources among competing activities (i.e. supplying customers) is the best possible way. Kennedy et al. discloses building a model of this supply problem, the model including items that flow through the supply chain and buffers that model the flow of these items, the input into buffers being referred to as producers and the output flows from buffers referred to as consumers. A planning system and algorithms are used to analyze this inflow and outflow of data to obtain an optimal supply chain plan. It would have been obvious to one of ordinary skill in the art at the time of the invention to use LP relation techniques (and branch and bound techniques) in order to increase the ease of obtaining an optimal solution by creating a model that allows one to divide and conquer by dividing a large problem into its smaller subproblems and conquering these subproblems individually. See page 515, sections 1 and 2, and page 517, of Hillier et al. See also figure 2, column 3, lines 40-60, and column 7, lines 30-50, which describes analyzing the model in pieces through upstreaming and downstreaming.

As per claim 2, Kennedy et al. teaches wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached (See figure 2):

selecting a buffer (See figure 2, column 3, lines 55-67, column 6, lines 54-67, column 7, lines 15-35, wherein a buffer is analyzed);

adjusting at least one time value of the time variable of the selected buffer to satisfy the constraint (See figure 2, column 3, lines 1-24 and 35-45, column 5, lines 20-30 and 42-60, column 6, lines 1-10, wherein priority and due date associated with each buffer is adjusted); and

proceeding to a next upstream buffer (See figure 2, column 6, lines 54-67, column 7, lines 15-35, wherein the decisions propagate upstream); and

repeating the following until a last downstream buffer is reached (See figure 2):

selecting a buffer (See figure 2);

planning production to supply the items to the selected buffer at the adjusted time value (See figure 2, column 3, lines 35-45, column 4, lines 48-65, column 5, lines 35-50, column 7, lines 30-65, wherein a production plan is based on downstreaming and time values are adjusted based on this plan); and

proceeding to a next downstream buffer (See figure 2, column 8, line 55-column 9, line 6).

As per claim 3, Kennedy et al. wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer (See figure 2, column 3, lines 55-67, column 6, lines 54-67, column 7, lines 15-35, wherein a buffer is analyzed);

adjusting the quantity of items at the selected buffer to satisfy the constraint (See figure 2, column 3, lines 1-24 and 35-45, column 5, lines 20-30 and 42-60, column 6,

lines 1-10, wherein priority and quantity associated with each buffer is adjusted (i.e. the quantity to be supplied on a specified date v. the quantity to be made late)); and

proceeding to a next upstream buffer (See figure 2, column 6, lines 54-67, column 7, lines 15-35, wherein the decisions propagate upstream); and

repeating the following until a last downstream buffer is reached:

selecting a buffer (See figure 2);

planning production to supply the adjusted quantity of items to the selected buffer (See figure 2, column 3, lines 35-45, column 4, lines 48-65, column 5, lines 35-50, column 7, lines 30-65, wherein a production plan is based on downstreaming and quantity values are adjusted to reflect the amount currently supplied); and

proceeding to a next downstream buffer (See figure 2, column 8, line 55-column 9, line 6).

As per claim 4, Kennedy et al. teaches wherein adjusting the optimized supply chain plan comprises adjusting at least one time value of a time variable of at least one buffer to satisfy a constraint (See column 3, lines 15-45, column 5, lines 35-60, column 7, lines 30-50, and column 8, lines 5-20, wherein a time value associated with a group of consumers (i.e. delivery) is adjusted). However, Kennedy et al. does not expressly disclose satisfying a lead time constraint.

Hillier et al. does not expressly disclose a lead time constraint.

Kennedy et al. discloses time constraints as well as using a model with buffers and a planning engine to manage safety stocks, safety times and timing of delivering items to consumers. These aspects (i.e. safety times and timing) are controlled by flow policies. It would have been obvious to one of ordinary skill in the art at the time of the

invention to include lead time in a safety time aspect in order to increase the user's control over how the planning is performed by including aspects, such as safety time and lead time, to meet deadlines set by the user. See column 1, lines 30-32 and 50-65, of Kennedy et al.

As per claim 5, Kennedy et al. teaches wherein adjusting the optimized supply chain plan comprises adjusting at least one time value of a time variable of at least one buffer to satisfy a feasible time constraint (See column 3, lines 15-45, column 5, lines 35-60, column 7, lines 30-50, and column 8, lines 5-20, wherein a time value associated with a group of consumers (i.e. delivery) is adjusted to make supplying the demand feasible).

As per claim 6, Kennedy et al. discloses wherein adjusting the optimized supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy a lot constraint (See column 2, lines 55-65, column 3, lines 15-45, column 5, lines 35-60, column 7, lines 30-50, and column 8, lines 5-20, wherein the quantity supplied at a given time is adjusted (i.e. only supplying 9 instead of 10) in order to satisfy restrictions on supply and manage lot sizes. Flow policies dictate these restrictions).

As per claim 7, Kennedy et al. discloses adjusting the optimized supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy a capacity constraint (See column 2, lines 55-65, and column 6, lines 30-50, wherein safety stock is discussed and managing flow rules to assure that a safety stock amount is able to be produced).

As per claim 8, Kennedy et al. teaches a system for generating a supply chain plan, comprising:

database operable to store data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint (See figure 1, column 1, lines 39-50, column 2, lines 24-35, 39-52, and 57-64, column 3, lines 20-45, column 6, lines 15-25, wherein data is accessed associated with a supply chain. Buffers are used to store items (i.e. resources, etc.) and associated time values (i.e. delivery time, timing), wherein the supply chain network is restricted by the amount of supply of items available);

a planning system optimizer coupled to the database and operable to:

using an algorithm for the supply chain network (See figure 1, column 1, lines 39-65, column 2, lines 25-32 and 55-65, and column 3, lines 25-40, wherein planning algorithms are used on the supply chain network);

calculating an optimized supply chain plan, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable (See figure 2, column 2, lines 39-65, and column 3, lines 7-32 and 40-65, column 5, lines 40-60, column 6, lines 1-15, and column 7, lines 30-50, wherein an optimized supply chain is produced by the planning system, where a quantity of items is described for each buffer based on time values); and

a heuristic solver coupled to the database and operable to adjusting the optimized supply chain plan to satisfy the constraint (See column 3, lines 15-45, column 5, lines 35-60, column 7, lines 30-50, and column 8, lines 5-20, wherein the supply chain is adjusted to satisfy the limited resources/production capabilities through successive stages).

However, Kennedy et al. does not expressly disclose that the algorithm used for the supply chain network is a generated linear programming problem, approximating this linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint, or calculating an optimized supply chain plan for the approximated linear programming problem.

Hillier et al. using a linear programming program, approximating this problem using discretized variables to yield a plurality of discretized variables and by relaxing the constraint to yield a relaxed constraint (See page 511, section 1, page 512, section 1, page 513, sections 1-2, page 517, section 1, wherein finite variables are used in an programming problem. In order to increase the ease of solving the problem, a linear programming (LP) relaxation problem is used, wherein a constraint of the problem is relaxed). Hillier et al. further discloses calculating an optimized solution supply plan for the approximated linear programming problem (See page 513, section 1-2, page 514, page 517, page 519, section 1, wherein the optimal solution is derived. See page 25, section 1, page 26, section 1, page 67, section 1, wherein a supply plan is considered).

Both Hillier et al. and Kennedy et al. are concerned with supplying limited resources among competing activities (i.e. supplying customers) is the best possible way. Kennedy et al. discloses building a model of this supply problem, the model including items that flow through the supply chain and buffers that model the flow of these items, the input into buffers being referred to as producers and the output flows from buffers referred to as consumers. A planning system and algorithms are used to analyze this inflow and outflow of data to obtain an optimal supply chain plan. It would have been

obvious to one of ordinary skill in the art at the time of the invention to use LP relation techniques (and branch and bound techniques) in order to increase the ease of obtaining an optimal solution by creating a model that allows one to divide and conquer by dividing a large problem into its smaller subproblems and conquering these subproblems individually. See page 515, sections 1 and 2, and page 517, of Hillier et al. See also figure 2, column 3, lines 40-60, and column 7, lines 30-50, which describes analyzing the model in pieces through upstreaming and downstreaming.

Claims 9-14 recite equivalent limitations to claims 2-7, respectively, and are therefore rejected using the same art and rationale as set forth above.

Claims 15-22 recite equivalent limitations to claims 1-8, respectively, and are therefore rejected using the same art and rationale as set forth above.

Claim 23 recites equivalent limitations to the combination of claims 1 and 2, and is therefore rejected using the same art and rationale as set forth above.

As per claim 24, Kennedy et al. discloses a method for generating an order plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint (See figure 1, column 1, lines 39-50, column 2, lines 24-35, 39-52, and 57-64, column 3, lines 20-45, column 6, lines 15-25, wherein data is accessed associated with a supply chain. Buffers are used to store items (i.e. resources, etc.) and associated time values (i.e. delivery time, timing), wherein the supply chain network is restricted by the amount of supply of items available);

using an algorithm for the supply chain network (See column 1, lines 39-65, column 2, lines 25-32 and 55-65, and column 3, lines 25-40, wherein planning algorithms are used on the supply chain network);

calculating an optimized supply chain plan, the optimized supply chain plan describing a quantity of items for each buffer and a list of producers operable to supply the items to each buffer (See figure 2, column 2, lines 39-65, and column 3, lines 7-32 and 40-65, column 5, lines 40-60, column 6, lines 1-15, and column 7, lines 30-50, wherein an optimized supply chain is produced by upstream and downstream planning, where producers are assigned to buffers to supply the items to the buffers); and

generating an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer (See figure 2, abstract, column 1, lines 39-55, column 2, lines 39-56, column 3, lines 15-40, wherein a production plan is generated where producers are associated with buffers).

However, Kennedy et al. does not expressly disclose that the algorithm used for the supply chain network is a generated linear programming problem, approximating this linear programming problem by discretizing the time variables of the buffers and by relaxing the constraint, or calculating an optimized supply chain plan for the approximated linear programming problem.

Hillier et al. using a linear programming program, approximating this problem using discretized variables and by relaxing the constraint (See page 511, section 1, page 512, section 1, page 513, sections 1-2, page 517, section 1, wherein finite variables are used in an programming problem. In order to increase the ease of solving the problem, a linear programming (LP) relaxation problem is used, wherein a constraint of the problem

is relaxed). Hillier et al. further discloses calculating an optimized solution supply plan for the approximated linear programming problem (See page 513, section 1-2, page 514, page 517, page 519, section 1, wherein the optimal solution is derived. See page 25, section 1, page 26, section 1, page 67, section 1, wherein a supply plan is considered).

Both Hillier et al. and Kennedy et al. are concerned with supplying limited resources among competing activities (i.e. supplying customers) is the best possible way. Kennedy et al. discloses building a model of this supply problem, the model including items that flow through the supply chain and buffers that model the flow of these items, the input into buffers being referred to as producers and the output flows from buffers referred to as consumers. A planning system and algorithms are used to analyze this inflow and outflow of data to obtain an optimal supply chain plan. It would have been obvious to one of ordinary skill in the art at the time of the invention to use LP relation techniques (and branch and bound techniques) in order to increase the ease of obtaining an optimal solution by creating a model that allows one to divide and conquer by dividing a large problem into its smaller subproblems and conquering these subproblems individually. See page 515, sections 1 and 2, and page 517, of Hillier et al. See also figure 2, column 3, lines 40-60, and column 7, lines 30-50, which describes analyzing the model in pieces through upstreaming and downstreaming.

As per claim 25, Kennedy et al. teaches wherein generating the order plan comprises repeating the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items (See figure 2, column 2, lines 38-65, column 3, lines 3-40, column 6, lines 22-29 and 40-53, wherein a buffer is selected);

planning production to supply the quantity of items to the selected buffer using at least some of the producers from the list of producers associated with the buffer (See figure 2, column 1, lines 40-65, column 2, lines 46-65, column 3, lines 8-30, column 6, lines 22-29 and 40-53, wherein a supply plan is produced); and

proceeding to a next upstream buffer (See figure 2, column 3, lines 35-55, column 6, lines 54-67, column 7, lines 15-35, wherein planning is propagated upstream).

As per claim 26, Kennedy et al. discloses wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer (See figure 2, column 2, lines 38-65, column 3, lines 3-40, column 6, lines 22-29 and 40-53, wherein a producer is selected from multiple producers based on ability to supply the buffer);

planning production to supply at least some of the items to the buffer using the producer (See figure 2, column 1, lines 40-65, column 2, lines 46-65, column 3, lines 8-30, column 6, lines 22-29 and 40-53, wherein a supply plan is produced);

determining a remaining quantity of items required by the buffer (See column 2, line 65-column 3, line 15 and lines 25-40, column 4, lines 48-65, column 5, lines 55-67, column 7, lines 1-30, wherein quantity remaining is determined); and

proceeding to a next producer on the list (See column 1, lines 50-65, column 3, lines 25-40, column 6, lines 20-30 and 40-52, column 8, lines 30-41, wherein a next producer is used to supply the items).

As per claim 27, Kennedy et al. teaches wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer (See figure 2, column 2, lines 38-65, column 3, lines 3-40, column 6, lines 22-29 and 40-53, wherein a producer is selected from multiple producers based on ability to supply the buffer);

planning production to supply at least some of the quantity of items to the buffer using the producer (See figure 2, column 1, lines 40-65, column 2, lines 46-65, column 3, lines 8-30, column 6, lines 22-29 and 40-53, wherein a supply plan is produced);

proceeding to a next producer on the list if there is a next producer (See column 1, lines 50-65, column 3, lines 25-40, column 6, lines 20-30 and 40-52, column 8, lines 30-41, wherein a next producer is used to supply the items); and

planning production regardless of the list if there is no next producer (See column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 30-41, wherein production is planned to make consumer delivery late when there is no next producer).

As per claim 28, Kennedy et al. teaches wherein generating the order plan comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers operable to supply the items to the buffer after the deadline (See column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 30-52, wherein producers are selected to make delivery of the item after the due date);

planning production to supply at least some of the quantity of items to the buffer using the selected producer (See column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 30-52, wherein producers are selected to make delivery of the item after the due date); and

proceeding to a next producer on the list (See column 1, lines 50-65, column 3, lines 25-40, column 6, lines 20-30 and 40-52, column 8, lines 30-41, wherein a next producer is used to supply the items).

As per claim 29, Kennedy et al. discloses wherein generating the order plan comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the producers operable to supply the items to the buffer at one or more supply times after the deadline (See column 2, lines 55-65, column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 40-67, wherein timing associated with producers is selected, wherein times after due dates are utilized);

planning production to supply at least some of the quantity of items to the buffer using a producer operable to supply the items at the selected supply time (See column 1, lines 40-65, column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 30-52, wherein a supply plan is produced to supply items at the specified time); and

proceeding to a next supply time (See column 3, lines 25-40, column 7, lines 30-50, column 8, lines 5-16 and 40-67, wherein a next supply time (a late time) is selected).

As per claim 30, Kennedy et al. discloses a system for generating an order plan, comprising:

database operable to store data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint (See figure 1, column 1, lines 39-50, column 2, lines 24-35, 39-52, and 57-64, column 3, lines 20-45, column 6, lines 15-25, wherein data is accessed associated with a supply chain. Buffers are used to store items (i.e. resources, etc.) and associated time values (i.e. delivery time, timing), wherein the supply chain network is restricted by the amount of supply of items available);

a planning system optimizer coupled to the database and operable to:

using an algorithm for the supply chain network (See figure 1, column 1, lines 39-65, column 2, lines 25-32 and 55-65, and column 3, lines 25-40, wherein planning algorithms are used on the supply chain network);

calculating an optimized supply chain plan, the optimized supply chain plan describing for each buffer a quantity of items and a list of producers operable to supply the items to each buffer (See figure 2, column 2, lines 39-65, and column 3, lines 7-32 and 40-65, column 5, lines 40-60, column 6, lines 1-15, and column 7, lines 30-50, wherein an optimized supply chain is produced by upstream and downstream planning, where producers are assigned to buffers to supply the items to the buffers); and

an order planner coupled to the database and operable to generate an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer (See figure 2, abstract, column 1, lines 39-55, column 2, lines 39-56, column 3, lines 15-40, wherein a production plan is generated where producers are associated with buffers).

However, Kennedy et al. does not expressly disclose that the algorithm used for the supply chain network is a generated linear programming problem, approximating this linear programming problem by discretizing the time variables and by relaxing the constraint, or calculating an optimized supply chain plan for the approximated linear programming problem.

Hillier et al. using a linear programming program, approximating this problem using discretized variables to yield a plurality of discretized variables and by relaxing the constraint to yield a relaxed constraint (See page 511, section 1, page 512, section 1, page 513, sections 1-2, page 517, section 1, wherein finite variables are used in an programming problem. In order to increase the ease of solving the problem, a linear programming (LP) relaxation problem is used, wherein a constraint of the problem is relaxed). Hillier et al. further discloses calculating an optimized solution supply plan for the approximated linear programming problem (See page 513, section 1-2, page 514, page 517, page 519, section 1, wherein the optimal solution is derived. See page 25, section 1, page 26, section 1, page 67, section 1, wherein a supply plan is considered).

Both Hillier et al. and Kennedy et al. are concerned with supplying limited resources among competing activities (i.e. supplying customers) is the best possible way. Kennedy et al. discloses building a model of this supply problem, the model including items that flow through the supply chain and buffers that model the flow of these items, the input into buffers being referred to as producers and the output flows from buffers referred to as consumers. A planning system and algorithms are used to analyze this inflow and outflow of data to obtain an optimal supply chain plan. It would have been obvious to one of ordinary skill in the art at the time of the invention to use LP relation

techniques (and branch and bound techniques) in order to increase the ease of obtaining an optimal solution by creating a model that allows one to divide and conquer by dividing a large problem into its smaller subproblems and conquering these subproblems individually. See page 515, sections 1 and 2, and page 517, of Hillier et al. See also figure 2, column 3, lines 40-60, and column 7, lines 30-50, which describes analyzing the model in pieces through upstreaming and downstreaming.

Claims 31-35 recite equivalent limitations to claims 25-29, respectively, and are therefore rejected using the same art and rationale as set forth above.

Claims 36-42 recite equivalent limitations to claims 24-30, respectively, and are therefore rejected using the same art and rationale as set forth above.

Claim 43 recites equivalent limitations to the combination of claims 24 and 26, and is therefore rejected using the same art and rationale as set forth above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Milne et al. (U.S. 6,049,742) teaches supply planning using a tool that considers production and distribution information as well as flush and flow guidelines on asset movement.

Baseman et al. (U.S. 6,671,673) teaches using business models to accomplish supply chain design, including the use of integer programming.

Ye (U.S. 6,374,227) teaches using LP relaxation to solve an resource allocation problem.

Wedlin (U.S. 5,343,388) discloses determining an optimal allocation of resources using a network of nodes and the flow through these nodes.

Dangat et al. (U.S. 6,041,267) teaches matching assets with demand using a decision support tool.

Ye (U.S. 6,321,207) discloses optimizing allocation of resources.

Sheikhzadeh et al. ("Design of Flexible Plant Layouts") is an article by an inventor of the current application, the article discussing layouts based on product mix and flow allocation between departments.

Grackin et al. ("Make Better Schedules : Planning and Scheduling tools are Improving") discloses scheduling using buffers and an optimizer performing linear programming

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beth Van Doren whose telephone number is (571) 272-6737. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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